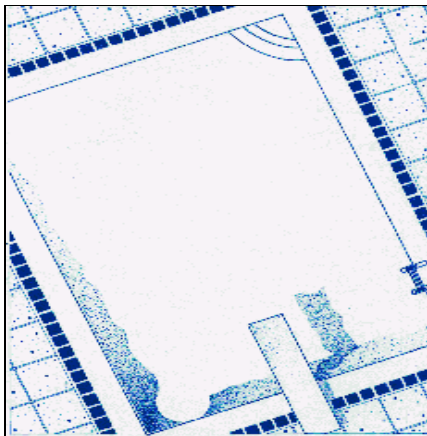




SHAPE UP YOUR RECREATION CENTER

Municipal recreational facilities are centers of civic pride and their popularity is overwhelming. Unfortunately, overwhelming is a word that also describes energy use in recreation centers.

The Colorado Governor's Office of Energy Conservation (OEC) recently conducted a study of recreation centers in Colorado and found municipal recreation centers to be among the largest energy users per square foot; larger even than hospitals. In fact, Colorado recreation centers were among the highest energy users in the western part of the United States.



Using Colorado as an example, a typical Colorado recreation center spends between \$1.50 and \$2.80 per square foot each year on energy. That adds up to between \$86,000 and \$160,000 annually. **And about one-third of the energy dollars are used to heat and maintain a clean pool.**

The good news is that your facility can save thousands of dollars each year just by making a few simple changes. Since recreation centers spend so much of their energy dollars on the pool and spa, we have identified 10 easy and practical money-saving steps your facility can take immediately in the pool room and elsewhere in your facility.



Tip #1 - Buy a Pool Vacuum that Returns Water to the Pool Instead of Sending it Down the Drain.

Pool vacuums intake water along with debris. The older models of pool vacuums send this pool water down the drain. The average facility loses 750,000 gallons of water a year along with the chemicals and heat in the water.

Try using a filtering vacuum that traps the debris in a cartridge filter and returns the water to the pool. A completely submersible model is recommended that can clean 7,500 square feet an hour while filtering 5,100 gallons per hour.

Potential Savings:	\$1,000 per year in make-up water heating energy; also save on water and chemicals
Potential Cost:	\$3,000
Payback Period:	3 years

Benefits: You'll eliminate the need to heat make-up water and cut energy costs. Also, about 750,000 gallons of water will be saved each year along with the chemicals used to treat it. Instead of spending up to four hours per week operating a pool vacuum, the automated models take only minutes per week to handle.

Tip #2 - Turn Off Special Pool Features When They are Not Needed. Also, Turn Them Off When Energy Demand Rates are High – Usually on Summer Afternoons.

In many modern swimming pools, features such as water slides, "bubble benches" and "rivers" use huge amounts of energy. A good way to save money is to keep them turned off when they are not in use. Scheduling the features during designated hours also is an effective technique. Additional money can be saved by keeping them turned off during peak electricity demand periods. Your local utility service representative can help you identify when peak demand occurs in your area. Typically, this occurs on summer afternoons between 2 and 5 p.m.



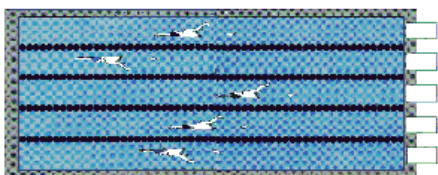
Below are savings opportunities for a typical modern pool featuring "Wild Water" (30 hp), a water slide (15 hp), a "Bubble Bench" (5 hp), and a "Rain Drop Tree" (5 hp). These savings would result if all features were turned off for one hour each day, and for several hours during peak demand days.

Potential savings:	\$2,200 per year on energy bills (includes \$1,200 in peak demand reductions); also save on water and chemicals
Potential costs:	None
Payback period:	Immediate

Benefits: The above energy savings result from reduced water pumping. Because less water will evaporate, less money will be spent adding water and chemicals. Indoor air quality will greatly improve since fewer chemicals from the treated pool water will be sprayed into the air. Wear and tear on expensive pumps and motors will be reduced. Potential also exists for savings on maintenance costs since reduced water

splashing — which corrodes the steps of the water slide — is likely to occur.

Case study: Steve Whipple, facility director for the East Boulder Recreation Center, says lifeguards leave water features turned off unless enough children ask to use them. The center was designed with 55 horsepower of operable water features. This simple operation saves the facility about **\$1,000 per year** as a result of the avoided usage. The facility saves an extra **\$400 per month** when features are not operated during summertime peak demand intervals. The lifeguards also routinely turn off the features to improve air quality.



Tip #3 - Backwash Pool Filters Only When Needed – When the Pressure Recommended by the Manufacturer is Reached.

Under typical pool operation, sand filters are backwashed as a regularly scheduled activity instead of when needed. This practice causes the filters to be backwashed about 10 percent more frequently than necessary. It also prevents the filters from keeping the water quality its best. As the number of particles rises (or when the filter pressure increases), the filters become more effective at trapping the smallest particles. Backwash only when the filter pressure gauge reaches the level recommended by the manufacturer.

Potential savings: \$290 per year on energy bills (for 30 square feet of filter area); save even more on water and chemicals

Potential costs: None
Payback period: Immediate

Benefits: Less backwashing reduces the amount of energy needed to heat make-up water. Since about 2,000 gallons of treated pool water are wasted each time the filters in a typical pool are backwashed, additional savings in water and pool chemicals will result.

Tip #4 - Wait Thirty Minutes to Backwash Pool Filters After You've Shut Off the Circulation System.

Sand filters are backwashed to release trapped particles from the filter. By waiting 30 minutes after the circulation system has been shut off to backwash the filters, the cycle will be much more effective. The sand bed filter will then settle and require half as much water to clean the filter.

Potential savings: \$1,440 per year on energy bills for 30 square feet of filter area

Potential cost: None

Payback period: Immediate

Benefits: Cutting the amount of backwash water in half also will cut in half the amount of make-up water and associated heat. While this requires some attention from the operator, the savings will be substantial at little cost.

Tip #5 - Experiment: Try Reducing the Water Temperature in the Lap Pool.



The annual energy cost of maintaining an indoor pool can exceed \$20,000. The higher the pool water temperature, the higher the energy bill. While bather comfort is important, even a two-degree drop in pool temperature can yield remarkable savings.

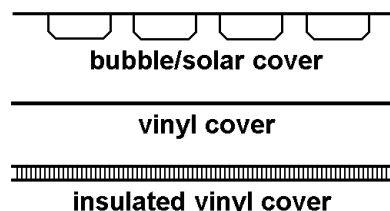
Try experimenting with various pool water temperatures, keeping in mind that no setting will please all swimmers. The lap pool is probably the best candidate for this experiment since lap swimmers often prefer cooler water temperatures when exercising.

Potential savings: \$1,600 per year on a 25-yard lap pool (with a two-degree temperature drop); also save on water and chemicals

Potential cost: None
Payback period: Immediate

Benefits: The above energy savings result from four sources. First, less energy is required to keep the pool at a

lower temperature. Second, because the lower pool temperature will result in less evaporation and therefore less humidity, less energy will be spent using fans to exhaust the humid air. Third, less energy will be required to heat air that would otherwise be needed to replace the exhausted air. And finally, since less water will evaporate from the pool, less replacement water will need to be heated. The reduction in water use also will cut costs on water and chemicals.



Tip #6 -Cover the Pool to Block Evaporation, Keep in the Heat and Reduce Room Ventilation Needs.

Evaporation accounts for over 70% of a pool's heat loss. This reason alone is enough to justify a pool cover. But a pool cover also can significantly reduce the amount of energy it takes to ventilate a pool room and heat the replacement air. Lap pools are the easiest candidates for covers because of their regular shape. A thin vinyl cover can be placed over the pool each night manually or automatically and stored away from the pool during operational hours.

Because of their higher water temperature, leisure pools also are great candidates for covers. Pool covers are probably the single greatest energy management technique for pools.

Potential savings: \$4,000 per year on energy bills for a typical 25-yard lap pool; \$2,000 per year for a typical 1,750 square foot leisure pool

Potential costs: \$20,000 for an automated pool cover; \$5,000 for a manual cover with roll away reels.

Payback period: 4½ to 5 years for an automatic pool cover; less than one year for a manual cover and reels.

Benefits: Pool covers will save thousands of dollars on energy bills by blocking evaporation and reducing the need for ventilation. This results in a need for less water and chemicals and fewer corrosive sanitation chemicals will be released into the air. This reduces tile cleaning and repainting time.

Case study: The University of Colorado's Student Recreation Center uses seven manually installed covers for a lap pool and dive pool. They are stored on two triple winder rotors on the deck. The center spent a total of \$9,400 on covers expected to last at least six years. The pool covers eliminate about 80 percent of the evaporation at night, saving the center \$8,485 annually. The covers paid for themselves in just over a year.

Case study: Skyland Recreation Center installed a state-of-the-art cover system in 1995, featuring touch-of-a-button installation. It is stored on wall-mounted winders. Ben Bezjak, Skyland's aquatics operator, finds the automated system very easy to use and worth the added cost.

Tip #7 - Cover Your Spa.

Using an insulated spa cover retains spa heat. It also blocks evaporation, which saves water and chemicals. In turn, this reduces the need to dehumidify the air, saving on ventilation and air heating. The spa's high water temperature makes savings from a cover particularly attractive. Select a rigid spa cover that can be manually installed. The least expensive covers are eight square feet. Custom fit covers also are available.

Potential savings:	\$300 per year on energy bills for a typical 100 square foot spa; also save on water and chemicals
Potential costs:	\$450 (more for a custom fit)
Payback period:	1½ years

Benefits: In addition to energy savings, as many as 5,000 fewer gallons of water will be needed each year (as well as chemicals needed to treat it). Fewer corrosive chemicals will be

released into the pool room environment, reducing need to repaint.

Case study: Breckenridge Recreation Center uses insulated, custom-sized covers for both their indoor and outdoor spa. They spent \$500 on each cover, which they anticipate lasting three to four years. The covers are stored against the wall in the pool area during the day. Although they can be installed by one guard, the process is easier with two guards.

The indoor cover saves the center an estimated \$320 per year and the outdoor cover cuts about \$340 off heating bills annually. Both covers will pay for themselves in a year and a half. Lisa Kaufman, aquatics operator, says, "I would definitely recommend using spa covers. They allow us to reheat the spas more quickly after dumping them — a real benefit. And, they pay for themselves."



Tip #8 - Install a Hot Tub Jet Timer with a 15-Minute Setting.

Since most jet timers turn on the blower for a 30-minute period, energy is wasted when someone only wants to sit in the tub for a few minutes. The air blower uses energy and the jets in the pool increase the heat and chemical losses from the tub. By switching to a 15-minute limit on the jet timer, substantial amounts of money will be saved. As long as the switch is located next to the tub, users who want to stay longer will not be inconvenienced.

Install a new jet timer with a maximum 15-minute setting. Opt for one without a spring as they are easily broken. Or, use a pin to block the existing timer from a high setting. The following figures are based on the assumption that a 15-minute timer saves 1½ hours of jet use per day.

Potential savings:	\$60 per year on energy bills; also save on water and chemicals
Potential costs:	\$200 for a new jet timer
Payback period:	3½ years (much shorter with lower cost options)

Benefits: Save energy by reducing the operation of the blower. In turn, the shortened jet time will save wear and tear on the air blower and hot tub jets. You'll also save on chemicals and water since less evaporation occurs when the water is calm.

Case study: The Breckenridge Recreation Center recently took two simple steps toward reducing energy used by their hot tub. They installed a 15-minute timer that can be turned off at the punch of a button. And, during medium and low occupancy seasons when the spa is not in use, the guards turned off the switch between five and 10 times per day. This operation saved the facility about \$50 during the first year. The switch cost \$100 so it will pay for itself in about two years. It replaces a spring return switch that often broke when patrons tried to turn it off.



Tip #9 - Switch to a More Efficient Spa or Pool Sanitizer.

A new water sanitation system known as an electrically-regenerated bromine chemical system can potentially yield significant savings. The system uses bromine salts, which are highly effective against bacteria and algae. After the pool is dosed with an initial supply of sodium bromide crystals, a small current is sent through the "brominated" water when it passes through a canister in the pool's water circulation loop. The process continually regenerates the bromine in the pool water, making it useful as a sanitizer and oxidizer.

Potential savings:	\$1,000 per year on energy bills for a typical 10-foot spa; also save on water and chemicals
Potential costs:	\$2,500
Payback period:	2½ years

Benefits: Spa dumping will be extended from once a day to once every three weeks, saving considerable time, water and water heating costs. Since the salts only need to be replaced when the water is drained or diluted, the system can potentially use 60 percent less chemicals than a standard sanitizer. Another big benefit is excellent water clarity; softer water will reduce the need for regular tile cleaning. And the non-corrosive bromine salts will reduce maintenance needs around the pool.



Case study: The Peak Health and Fitness Center in Nederland has an electrically-regenerated bromine system on an 800-gallon spa that serves a heavy load of 50 bathers a day. In the year since installing the system, they have not needed to empty their entire spa. They empty one-fourth to one-third of the spa water each time they backwash the filters, every two to three weeks.

The reduced water dumping saves the center \$675 per year in water heat. Chemical savings alone would probably pay for the system. The staff adds only \$25 worth of chemicals each month to make up for those lost to backwash; an expenditure that is much lower than with any other sanitation system.

The system provides clear, maintenance-free water. The chemical balance of the system is fairly steady, and can easily be adjusted with city water when the acidity gets too high. The operator, Kevin Seeman, is pleased with the system, "There is a maintenance benefit. There aren't as many chemicals to haul around, and safety training is not as intense as with other systems. The spa could even be dubbed a mineral bath."

Tip #10 - There are Many Energy-Saving Ideas to Use Throughout Your Facility.

- ◆ Turn off lights when not needed or where daylight is sufficient. The savings add up fast making this a worthwhile task.
- ◆ Use a photo sensor to turn outside lights on and off. The reduction in energy use will quickly pay off the investment.
- ◆ Replace incandescent bulbs with compact fluorescents. This will cut energy use for each socket by 75 percent. Get a quick six-month return on your investment on bulbs that operate 12 hours a day or more.
- ◆ Replace fluorescent tubes and magnetic ballasts with T8 tubes and electronic ballasts, and cut energy costs about 30 percent per fixture. In a building that is occupied eight hours daily or more, this retrofit is worth investigating. The payback is generally within five years and there are many other people-pleasing benefits of improved lighting quality.
- ◆ Install low-flow showerheads to save water and heating energy costs. These have a relatively low-cost and deliver a payback in a few months.
- ◆ Install flow restrictors on sink faucets. These cost only a few cents per faucet and have a quick payback.
- ◆ Unplug the chiller on your drinking fountain. This delivers immediate savings at no cost.
- ◆ Automatically reset room temperatures at night (let the temperature fall about 10 degrees in winter or rise 10 degrees in the summer). Install automatic thermostats where possible or implement a routine to manually reset them to get the best savings from this recommendation.
- ◆ Shut outside air dampers after your building closes (be careful to avoid freezing problems). This costs

nothing and delivers immediate savings.

- ◆ Install high efficiency pumps and motors during replacement. Motors generally consume several times their initial cost each year. High efficiency motors and pumps can pay for themselves in a few months to a few years depending on their operation schedule.



For more information about energy savings for pools or recreation centers visit the **RSPEC** site on the World Wide Web at:

<http://www.eren.doe.gov/rspec/>

The site contains additional fact sheets and free software that can be downloaded for calculating the cost of heating a pool and the savings from using a pool cover or solar pool heating system.

Additional energy saving information can be obtained by calling the U.S. Department of Energy's Energy Efficiency and Renewable Energy Clearinghouse at **800-DOE-EREC**.

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